1205

DATA PROCESSING DIGEST

A SERVICE OF CANNING SISSON AND ASSOCIATES

© Canning, Sisson and Associates, 1956

VOLUME 2 NUMBER 11 | 1140 SOUTH ROBERTSON BOULEVARD • LOS ANGELES 35, CALIFORNIA | NOVEMBER 1956

General Information

LIBRARY OF THE
DEC 3 1956
UNIVERSITY OF ILLINOIS

"Is gobbledygook shrouding automation techniques?"

V. Donald Schoeller, Case Institute of Technology, Cleveland
OFFICE EXECUTIVE, October 1956; pages 9–12.

The point made in this article is that office automation is not a magic tool for making the office more efficient, but is rather a technique to be used after careful study, to aid in scientific management. Businesses need a new concept of the management job as expressed by Dr. Harlow S. Person at the Eighth International Management Conference in 1948: "Generally, throughout all areas of management, including industry, there is absence of an over-all perspective and a comprehension of scientific management as an integrated whole...The interest has been focused on mechanisms and devices...Specialization in mechanisms and phases have become dominant ...'"

First, the team concept of management must be developed. Old departmental lines must be crossed over. "No longer can a decision be made in one area of management without thinking of the repercussions that will occur in other phases of managerial activity as a result of a particular decision."

Seven basic areas of coordination in management activity are suggested:

1. Manpower. "...develop a more clear-cut understanding of the exact type of individual required for each job."

2. Materials control and standardization. "Standardize specifications for the type of material in all activities in your business."

3. Machine purchase, replacement and utilization. Depreciate equipment on the basis of obsolescence rather than long-term depreciation accounting methods.

4. Monetary and fiscal policies. "Coordinate your fiscal policies for the purchase of new machines, changes in material specifications and manpower controls with all the other phases of management."

CONTENTS

1 General Information
8 Management Decision–making Techniques
9 Applications
14 Programming
14 Equipment
15 Comment
19 Training
20 Meetings
21 References

5. Methods and procedures analysis. A method should be viewed in terms of the entire organization.

6. Market coordination and control. This includes "sales policies, types of products sold, services advanced to customers, types and kinds of invoices sent out and discount policies for your customers."

7. Managerial coordination and participation, including task analyses for the management group, and participation in decisions affecting over-all structure.

Team-management is needed for full use of office automation

In beginning an investigation into automation, a sound simplification and methods program should be set up immediately. The program should include training of all levels of management, investigation of possibilities of changing and standardizing the methods of all jobs as quickly as possible. Note places where simplified automation such as single writing systems might be used. Begin standardizing all job analyses and evaluation of materials, machine processes, monetary and fiscal policies, systems and procedure policy manuals, sales manuals and standard operational procedures for management decisions. From here on the company can move logically toward mechanization. These steps may have taken as much as two to five years.

In preparing for automation, eight steps are necessary:

1. Information flow analysis. Collect samples of all reports, chart every activity.

2. Reporting systems and report studies. Duplications and unnecessary reports will show up here.

3. Work distribution analysis--from top management to lowest levels of management.

4. Forms design and control. Eliminate unnecessary forms.

5. Job description, analysis and simplification. Study entire personnel placement system.

6. Work measurement. Standardize and measure time required for clerical tasks.

7. Record and filing procedures. Standardize to fit with common language and microfilming procedures in future.

8. Layout and space utilization. Look forward to location of new machines.

The company should build toward automation without a heavy investment in equipment. "All the potential cost savings should be achieved before the installation of the expensive machinery that can soon become obsolete....Many of the steps discussed...require no expensive investment in equipment. But they do require a set of sound policies to lay the foundation for further mechanization." Automation as an extension of scientific management, says the author "is based on over-all managerial cooperation

rather than on individual projects aimed at solving problems of the moment."

Once the concept of scientific management has been established and put into effect, and the company is ready to investigate the possibilities of automation, the standard procedure for investigation can proceed. The author suggests the selection of a staff person at top management level to coordinate the program, along with a committee of top operating people.

"Electronic computation and operations research"

Dr. J. Kates and L. E. Sandford, KCS Data Control Ltd., Toronto
Reprint from CANADIAN CHEMICAL PROCESSING, May 1956.

Coordination of company functions is aided by O.R. and computers

Business data processing as viewed by a firm of Canadian consultants is the subject of this interesting article.

"...the top executive cannot dismiss these machines as just new and expensive aids to office accounting or as mere improvements in existing techniques. On the contrary. The electronic computer is the most powerful management tool ever devised and its effect will be fundamental, far-reaching and lasting."

Several examples of use in the oil industry are included:

"...Canada's British American Oil Co. has recently been using figures produced on a computer to discover the best combination of crudes, plant time, and storage capacity, in their refineries....Imperial Oil's Marketing Research Division used the electronic computer at the University of Toronto to simulate a projected warehouse operation [by which] a projected multi-million dollar operation was tested at an expenditure of a few thousand dollars."

This consulting firm estimates that "about twenty computing and data-processing systems will be installed [in Canada] by December of this year and over fifty by December of next year."

There is a rather nice description of a computer's limitations:

"When a computer is installed in an office or laboratory it is at first useless and its store or memory is as empty as the mind of a new-born child. To convert this mass of circuitry into a powerful tool we must feed into it a series of detailed instructions called a program.

"Into a program can go man-weeks, man-months or man-years of preparation, but once a program is completed it can be fed into the computer in a few minutes, and may thereafter be used year after year. Moreover, as many programs as desired may be developed for the same machine and by means of these different programs it may produce a pay-roll at 9 a.m., a chemical analysis at 10 a.m., the design of a catalytic cracking unit at 11 a.m., a

management analysis at 12 a.m. and so on. Not only is such versatility possible but this is precisely the way a computing machine should be used for greatest efficiency.

"Before a task can be programmed it must be understood in detail and all existing routines, systems and procedures relevant...have to be defined and analyzed. When companies subject their procedures to this analytical enquiry they often find that their whole structure, which has grown up over a period of years, consists of many bits and pieces which are not properly co-ordinated and which are sometimes operating almost independently of each other...."

"What is the solution? On the one hand companies are faced with a management problem--the need for optimum utilization of resources, men and machines. On the other they see the tremendous success of scientific methods in purely technical areas. Why not apply scientific methods to management problems generally? Why not, in short, use a new and increasingly popular management tool--Operations Research?"

A discussion of operations research concludes the article.

"Establishing an integrated data-processing system"

Special Report No. 11, published by
American Management Association, 1956

An aid to management control

The point of view of this report is that good management is good management in any point of time and that it is implemented through the available techniques and equipments of its particular period. Thus, IDP (integrated data processing) is viewed as a new concept to help management do the "good" job it aims to do. "To *top management* [IDP] means the ability to control operations, set policy, and base forecasting upon data which have been systematically developed...through an integration of over-all company functions...." EDP, or electronic data processing, is viewed as a part of an IDP system, where it is found feasible to be used. Thus, IDP can be applied to any size of business, whereas EDP is applicable only where the amount of repetitive data processing is very large.

With this viewpoint established, the report continues to lay out a plan of study and procedure for installing IDP in a business organization. The report divides into five sections:

The preliminaries, in which are discussed the theory of IDP, its meaning to a company, how management should go about studying IDP, planning for a study, and making the company survey.

Tailoring the program, which describes "the using [of] IDP principles to design a program tailored to specific needs," the types of hardware to be used, cost factors, and presenting the idea for acceptance by management.

The installation process, including the provisions for installing and providing for procedures for the equipment, the integration of electronic computers when and if the system warrants this equipment, and a list of possible missteps to watch for.

IDP and the worker, the selection of an IDP staff and human relations problems introduced by the new system.

The long view, which suggests the economic benefits to be derived from IDP, and a plea to get a program started in order to reap the benefits.

In general, this report seems to say "business as usual, but start being efficient about it." There is no suggestion that IDP will affect the company organization-wise, except in a very superficial way. It does suggest that any business can do better than it is now doing by rousing itself from its habits of long standing and taking a good long look at its data processing system.

The report is adapted from material originally prepared by Ernst & Ernst for an AMA orientation seminar. Price $4.50. (AMA members: $3.50).

1956 N.M.A.A. Convention

JOURNAL OF MACHINE ACCOUNTING, October 1956.

Preparation, applications, and equipment are subjects of papers

The entire issue is devoted to some of the papers presented at the National Machine Accountants Association convention. These include:

"Analyzing and appraising office operations," by Robert H. Gregory, M.I.T. It is suggested that it is "not suitable to do systems analyses in terms of techniques in use in the office which are going to be replaced shortly after the systems study is completed." Also, "the study of the 'value' of information for both operational and managerial purposes has been neglected as more attention has been focused on the cost of processing data."

"Applications of integrated data processing," by T. E. Aiken, National Tube Division of U. S. Steel. The way in which common language concept and equipment has been used in integrating clerical operations at National Tube is described.

"Marketing for the food industry," by Robert J. Ingram, Certified Grocers of California. New ordering procedures are making use of mechanized equipment, and resulting in improved inventory control.

"Univac system," by R. D. Dotts, Pacific Mutual Life Insurance Company. The way in which the company went about preparing for and installing its large scale computer is described.

"IBM 700 series," by J. B. Hughes, Proctor & Gamble Co., and D. D.

McCracken, General Electric Co. A description and an evaluation of the IBM 700 series calculators is given.

"Univac file computer," by E. A. Acker, Ethyl Corporation. This article is well illustrated with flow charts to show how the File Computer is used at Ethyl for inventory control, procurement, and financial control. Two goals were established at the beginning: 1) To develop methods and procedures which best serve the company rather than individual departments; 2) To integrate into a single record, regardless of how voluminous, all data pertaining to a given area of activity. Inventory files are maintained on magnetic tape rather than the internal memory, and changes are processed in sequence. Accounts payable activity is processed in random fashion. The majority of the article described the processes shown on the flow charts. The company feels the value of the File Computer is in its "building block" structure, making it adaptable in size and power for the capacity needed.

"How to get ready for automation"

Forde Steele, Central National Bank of Cleveland
BANKING, October 1956; pages 34–36, 162–169.

Bankers should begin now

With the acceptance by the A.B.A. of the report on common machine language recommended by the committee on the Mechanization of Check Handling, automation is due for rapid adoption by many banks. Savings as well as commercial operations will be affected, influenced by the A.B.A.'s committee report on equipment designed for savings operations. A check list of twelve points is given for the banker who would be prepared for future developments:

1. Learn what automation means for banks.
2. Assign someone to become the "expert" on the subject for your bank.
3. Keep employees informed.
4. Become familiar with the fundamentals of account numbering.
5. Prepare for a change in check design.
6. Urge your check printers to prepare for the coming changes in check design and imprinting.
7. Establish a program of recording activity figures.
8. Study and improve present procedures.
9. Keep stock of supplies at reasonable levels.
10. Consider centralization of all bank accounting records.
11. Condition your thinking to the new philosophy of automation.
12. Become familiar with the role of consultants.

"Automating the engineer's task"

J. Kates, KCS Data Control Ltd., Toronto
Reprint from THE ENGINEERING JOURNAL, August 1956.

Computers for engineering problems

"...if, for better or worse, we are to continue our present rate of material progress, engineers will have to automate some of their own tasks."

In this article, the author suggests some of the ways in which engineers can turn over to electronic computers some of their more arduous tasks, analysis being suggested as one of the most fruitful fields for computer use. The article is concluded with an amusing but enlightening comparison of mathematical analysis, simulation, and Monte Carlo methods of attacking a design problem.

"What computers can do for you"

NATION'S BUSINESS, October 1956; pages 40–43, 108–111.

How to begin a company study

The executive who has not yet become acquainted with the use of computers in business, will find this article an excellent introduction. The familiar pattern of preliminary study of a company's data processing requirements is suggested, followed by an explanation of the computer system by comparing it with the usual clerical procedures. The reader is then given some suggestions on how to choose equipment. The final section of the article is composed of examples of computers in use in small, medium, and large businesses covering a wide variety of applications. Reprints of the entire article are available from NATION'S BUSINESS for 15¢ each.

"Integrated data processing"

H. S. Brown, R. L. Crain Ltd., Ottawa, Ontario
COST AND MANAGEMENT, September 1956; pages 312–318.

IDP in Canada

Integrated data processing is viewed as a two–fold benefit to business: 1) as a necessity for efficient means of input to electronic data processing systems, and 2) as a method by which smaller businesses can eliminate costly repetitious paperwork, and obtain on a smaller scale some of the data analysis advantages offered by electronic systems.

Management Decision-making Techniques

"Use of transfer functions for company planning" *

Gordon K. Johnson and Inez M. Turner, Minneapolis–Honeywell Regulator Co.

Engineering–sales–production is like a servo-mechanism system

In many industries sales are almost entirely dependent upon the engineering activities. This happens where the product is technologically complex and has a relatively short sales life, or where the product is produced in small quantities. Also, engineering effort may continue to modify and improve the product to insure continuing sales. These differing engineering needs cause variations in the time lag between the development engineering and the first shipments. The amounts shipped and the varying times of shipment influence the loads on the factory, causing peaks and valleys in production. Proper time phasing in production of various products can smooth out the fluctuations and achieve an optimum load level. But this is dependent upon the way in which engineering effort is planned.

It was found that "this problem was analagous to that of a servomechanism system for which mathematical techniques have been developed and applied successfully. The study resulted in the development of a 'transfer function' formula which has proven to be a useful tool for measuring the relationship between engineering effort and sales."

First, *engineering effort* was defined as both the research and development and the production engineering time devoted to each product. Sales were defined as the dollar value of products shipped. When statistical data on engineering and sales were compiled and charted, it was discovered that engineering and sales showed remarkably similar patterns. A relationship between engineering effort and sales was then defined by application of the transfer function of servomechanism theory.

"The transfer function has been valuable in helping to obtain an understanding of the amount and timing of engineering effort needed to meet sales forecasts. This can be done by considering expected or desired sales as the input to a system and the engineering effort as the output. Then for a given sales forecast, the amount and timing of engineering effort needed to support these sales can be presented to management to aid them in making decisions on hiring programs, the facilities which will be needed, and when personnel and facilities will be required."

In the problem of fluctuations in sales, "the transfer function helps to determine the proper timing of engineering effort to insure a steady level or growth of operations. It indicates when sales slumps are likely to occur and further renders possible the calculation of the timing and magnitude of engineering effort that should be expended to prevent the expected sales slump."

Other uses for the transfer function in the sales-engineering-production relationship are suggested in this paper.

* To be published in OPERATIONS RESEARCH, December 1956.

Applications

"Pan American's electronic data–processing center"

John S. Woodbridge, Pan American Airways
THE CONTROLLER, October 1956; pages 466, 467, 500.

Passenger and cargo accounting were programmed first

((It is a pleasure to read about an electronic installation which is apparently a happy and successful one. Those who are approaching the inevitable EDP with trepidation may take heart from the experience of Pan American described in this article.))

Pan American's IBM 705 was officially ready for business May 15, 1956. From December 1955 to March 1956, the physical requirements for it were provided for by contractors retained and directed entirely by Pan American personnel. Meanwhile an "Electronics Development Group of top-level, highly qualified employees, expert in their particular fields of accounting and control operations....formed the nucleus for our revenue application team." Later the group was split into two teams, one to deal with passenger and the other with cargo. Each team had its own group of "diagrammers," programmers, and operating personnel. The first routines were tested on the IBM computer at Poughkeepsie; all tests are now made on the PanAm installation. "As planning on each individual application is concluded, our people in the Electronics Development Group will return to their respective sections to follow through on the actual installment of the electronic procedures....A small core of staff and methods men will remain in the group and will be charged with constant review of existing applications....From time to time it will be assigned to new projects, together with top operating people concerned with the particular project."

"Our present plans provide for our accounting work to be assimilated on the new equipment in the following order: Cargo revenue, passenger revenue, payroll, materials inventory, traffic and crew statistics, and general books."

Some interesting figures are given on the scope of the programming job: "Cargo consists of 38 different diagrams and programs with 31,000 program steps. Passenger consists of 42 different diagrams and programs with 33,000 program steps. Payroll consists of 21 different diagrams and programs with 30,000 steps."

Pan American does not intend to parallel applications on their EAM equipment, and will release this equipment to the manufacturer as it is no longer needed.

In regard to personnel relations, the company went over the plans more than a year ago with the Union representatives, and worked out satisfactory arrangements to assign employees to temporary jobs where needed during the transition period, until they could be reassigned to new jobs or to their original ones.

Pan American's three objectives in determining the need for electronic equipment were:

1. Removal of limitation of transcribed information from that contained in present 80 or 90 columns and substitution of limitless capacity per unit of information.

2. Elimination of the interruption in processing due to the use of a variety of machines and resulting manual cross-handling.

3. Improvement of quality of information developed for management, concurrent with decrease in quantity of detail.

Quality of information obtained is the most important result

"The third objective...deals with our minds and requires a great deal of delving as well as forthright action on the part of management to expose it to its fullest extent. It...contains an untapped reservoir of economy of unbelievable proportions." For example, "almost all executives have many chores which require poring over figure facts....some of these examinations are so automatic as to be considered instinctive; where they are that simple, let us charge the machine with that type of activity....At the lower echelons of our business, this evaluation is even more widespread....This machine's versatility for acceptance of instructions of this nature can release us from this bondage and give our minds more and more opportunity for constructive and visionary exploration."

One problem which Pan American is engaged in solving is that of input. "Since tabulating cards are the major entry to magnetic tape, we have numbers of key-punch operators putting documentary information at slow speed into cards so that we can then transfer it onto the tape....We see in the near future an electronic scanner with multiple heads and minimum hardware, capable of handling a variety of documents directly onto paper tape or magnetic tape rather than onto tabulating cards, all at speeds far in excess of our existing processes."

Transcribing of data from tab card to magnetic tape is a similar problem, the speeding up of which is considered a "must."

The article ends with this paragraph: "If this discussion can serve as assurance to you on the threshold of electronic data-processing, particularly from the standpoint of having confidence in the ability of your own people competently to handle the tasks involved, I will be content. We have naturally had pains during our gestation period but are more than ever convinced that in Pan American our 705 has and will continue to create new life within our data-processing concepts."

"Electronic equipment for savings and mortgage operations"

ENGINEERING NEWS-RECORD, August 4, 1956, pages 5, 7, 37, 38.

A report on the equipment now available or planned for savings and mortgage operations is made by the subcommittee of the ABA.

"Wage accounting by electronic computer"

Published by the National Physical Laboratory of Great Britain

DEUCE used in payroll study

This 57-page pamphlet is the first report published by the British government on the application of electronic equipment to the payroll problem. Although the computers themselves are available in England, the auxiliary equipment which makes them useful for such applications as payroll have not been developed as fully as in the United States. ((DPD readers will recall, however, that the Lyons Company has been using its own LEO for its payroll and ordering operations for some time. See DPD: November 1955, page 12; August 1956, page 14.))

A detailed study was made of the wage accounting operations at the Central Office of the Ministry of Pensions and National Insurance. This was carried out as though a specific computer system were available for use. A hypothetical computer system is described, based on the use of DEUCE, a computer being developed by the National Physical Laboratory. Alternative methods are suggested also, based on the possible use of existing computers. The wage accounting application is discussed in detail. Costs of setting up the system are developed. Programming and program checking are thoroughly discussed, and a chapter is devoted to the problem of data sorting.

This is a very complete and interesting report, generously illustrated with flow charts to give a clear idea of the development of the process. It should certainly be a basic item in the computer library of British businessmen, and is a valuable addition to the libraries of American businessmen as well. Americans will find that British terms and monetary values slow down the reading somewhat, but the basic idea is intercontinental.

The pamphlet may be ordered from Her Majesty's Stationery Office in London, price: 2s, 6d. American source: British Information Services, 30 Rockefeller Plaza, New York 20, New York. Price: 50¢ postpaid.

Our readers in Great Britain will be interested in knowing that this pamphlet is discussed in THE ACCOUNTANT, September 15, 1956, pages 249, 250. This is an editorial which gives an extensive evaluation of the contents. On pages 265–270, of the same issue, excerpts are printed from sections 8, 11, 12, and 14 of the pamphlet.

"Electronic equipment for savings and mortgage operations"

Everett J. Livesey, Dime Savings Bank of Brooklyn, New York
UNITED STATES INVESTOR, October 6, 1956; pages 51–62.

Savings banks are ready for equipment--but what kind?

In addition to the industry recommendations made by the American Banking Association on electronic equipment for savings banks, a group of banks through the east and into Ohio have formed the Savings Banks Research Group. "The purpose of the group is, through co-operative action, to determine whether or not the several manufacturers can in fact produce the equipment which

they are describing to us, whether the equipment is sound from an engineering and electronic viewpoint, whether it will actually do the job, whether it is reliable and dependable, etc."

Both the large scale completely electronic system recommended by Teleregister and Laboratory for Electronics, and the off-line equipment suggested by Burroughs and NCR are described. The question is asked whether the newer, smaller companies know the answers better than the "old line" companies. The point is stressed that "the ability of the proposed equipment to improve customer service and speed up transactions is a basic point which banks should insist be settled positively before orders are placed." It is suggested that not only the large banks be up to date on developments. "...there seems to be no good reason why banks which are ten, twenty, even one-hundred miles from each other, cannot get together, work out an arrangement for an installation to be located in some central spot, on a co-operative basis, and thus obtain all of the advantages of the new equipment...."

"Insurance company expects electronic system to pay for itself in 4 years"

CREDIT & FINANCIAL MANAGEMENT, October 1956; pages 24–26.

One master file of policy information

Franklin Life Insurance Company expects to pay for its Univac in four years. Twelve existing policy records have been combined into one master file which contains all the necessary information about each policy. A separate file contains names and addresses of policy holders, used only when preparing premiums and saving processing time on the master file. Preparation of programs, the training of programmers and engineers, and purchase of tapes and other materials cost $150,000. The company estimates the operation of the data processing department, which will require 35 to 40 persons, will cost about $150,000 a year, exclusive of programming.

"Communications...in the decade ahead"

RAILWAY AGE CENTENNIAL ISSUE, September 1956; pages 290, 291.

Good communications essential

"The indispensable preparation to the full use of data processing equipment is expansion and refinement of a railroad's communications system."

Here are a few of the facts presented in this article which indicate the progress in such expansion:

Several other railroads are actively interested in joining the coast-to-coast passenger reservation system being installed by the New York Central, New Haven, and Santa Fe Railroads.

Printing telegraph is being installed in greater quantities. Soon all major railroads in the U. S. and Canada will use it for system-wide car reporting systems. "By 1966, coast-to-coast car reporting, covering virtually every railroad in the country, will be in service."

"Approach to electronics," Parts 1 and 2

W. D. Babcock, Jr., Keystone Automobile Casualty Co.
BEST'S LIFE NEWS, September and October, 1956

A medium size application

Keystone is a medium-sized automobile insurance agency, which felt it had a potential electronics application. For more than a year the company has been studying its applications for two machines, the Univac File Computer and the IBM 650, and has actually prepared programs for both systems, and tested them on the equipment at the manufacturers' locations.

Keystone's reasons for feeling it could justify a computer were:

1. Centralized policywriting (eliminating the need to contend with a myriad of small production units).

2. Primarily concentrated in automobile insurance (resulting in reducing the number of machine programs necessary to cover the majority of volume).

3. Operations concentrated in six eastern states (reduces communication requirements and complexities of contending with many varying state rate systems).

4. No changes required in basic company operating policies (such as function relationships between company and agent).

5. Presently have standard procedures for the entire company.

Concurrent with the preliminary study was a survey of the housing needs, and the shifting of departments to provide for space in that part of the building which met the structural requirements.

"Intermediate Univac solves purchasing problems"

Joe Crabtree, Remington Rand
PURCHASING, October 1956; pages 124–128.

Automation helps purchasing function

The use of a Univac File Computer in purchasing parts for an automotive assembly plant is described. A flow chart shows the materials control procedure.

In the same issue are the following articles on the use of electronic devices in the purchasing function:

"Better tools for a bigger buying job," an editorial, pages 71–74.

"Purchasing with punched tape," pages 75–78.

Programming

"Programming business–data processors"

Grace Murray Hopper, Remington Rand
CONTROL ENGINEERING, October 1956; pages 101–106.

Programming goes on... and on...

Continuing the series on the application of digital computers, article No. 8 presents the director of programming research at Remington Rand, Dr. Grace Hopper, who describes the complexity of a program for a business application, using inventory control as her example. Charts are used to show the minute detail in which the program is described. Moreover, a program for a business application can never be considered completed. New information or criteria will demand new routines, and refinements can be made in a program as long as the program is to be used. ((This article belongs in the files of the systems analyst and the programmer.))

"Word length in digital computers"

D. D. McCracken, General Electric Co., Cincinnati, Ohio
COMPUTERS AND AUTOMATION, July 1956; pages 14, 15.

Trend toward variable length

There is a trend toward variable word length, not only in numbers but in addresses. For example, instructions may follow each other with a mark or separator between them. Operations which do not require addresses may be decoded as such. Addresses which require fewer digits than others could occupy only the digits needed, followed by "end-of-instruction" mark.

Equipment

"IBM opens way to new markets"

BUSINESS WEEK, September 15, 1956; pages 43–50.

New products described

Three new IBM systems are described in this article: the APR (Automatic Production Recording) system, the RAM (Random Access Memory), and the RAMAC (Random Access Memory Accounting Machine). A large diagram shows how the APR might be used in a dairy for the milk-receiving operation.

The APR and RAMAC are also announced in following:

"IBM introduces four major office machine developments"

OFFICE MANAGEMENT, October 1956; pages 42, 43, 116, 117.

"New electronic computers keep business data fresh"

ELECTRONIC WEEK, September 24, 1956; page 5.

Comment

Factors to consider in a contract for a large-scale electronic computing system.

The acquisition of a large-scale electronic data processing system is a major contractual obligation for any company. As such the contract must be drawn up with considerable care from both the legal and technical points-of-view. The list below is intended to aid this contractual planning by calling attention to the various technical aspects important in acquiring an EDP system.

I. Price

A. If the equipment is purchased, the possibility of making payments in several installments should be considered.

B. If the equipment is rented, the following factors should be considered:

1. What are the additional rental charges for second, third and fourth (weekend) shifts (rental for additional shifts is usually proportional to the actual scheduled time each piece of equipment is used).

2. The degree of maintenance to be provided on extra shifts (see III).

3. Is there a clear definition of the primary shift (this may be 8 hours per day, or equivalent to user's normal shift, etc.)

4. Is there to be an option to buy; what are the details, especially as to the percent of rental which can be applied to its purchase.

II. Delivery

A. The delivery date should be specified; see Note 1.

B. The date by which the system should be in complete operation and accepted by the user should be specified.

C. Penalties for delays in putting the system into operation after the date specified should be considered (the user will be losing money each day he waits for a machine since it has already cost hundreds of thousands of dollars in preparatory work.)

III. Maintenance (because of the decree against IBM, maintenance contracts in the future will be separate from equipment rental contracts)

A. The level of maintenance personnel (engineers, technicians) may be specified.

B. The number of maintenance personnel available on each shift may be specified.

C. The availability of service should be specified. That is, are maintenance personnel at the user's installation full time?

D. Is the cost of parts included in the maintenance contract or paid for by the user? In the latter case, specify who maintains stocks of parts to provide prompt service. Also in the latter case, the user should have some assurance that the price of replacement parts will not increase unreasonably.

E. The contract should specify who provides space, power, furniture, etc., for maintenance personnel.

IV. Emergency Machine Time

The supplier should agree to make available to the user, time on a system (with identical components and optional features as in the user's system), in case the user's machine is down for more than a specified time.

V. Engineering Improvements

A. The supplier should agree to replace or modify components or units that have been re-engineered because they are unreliable (possibly "unreliable" should be defined more clearly). Such replacements or modifications should be made at no cost to the user, at least, for a period of several years after delivery.

B. The supplier should make available to the user replacements or modifications to improve the performance of the system. The user will probably have to pay for this type of change.

VI. Auxiliary Services

The contract should specify the minimum services which the supplier will provide in these areas:

A. Training programs

B. On-the-job programming assistance

C. Manuals

D. Prepared or library programs.

VII. Shipping and Installation

The contract should specify:

A. Which party pays the cost of shipping

B. The F.O.B. point (to determine when the transfer of title takes place, if purchased)

C. Which party pays the cost of installing and testing the equipment between delivery and acceptance.

VIII. Environmental Conditions

The contract should specify the minimum environmental conditions under which the manufacturer's guarantee still applies. Allowable variations in these factors should be specified:

A. Temperature

B. Humidity

C. Power voltage, frequency, and wave form

D. Space, in particular around each unit to allow for maintenance.

(These are important because they determine the amount the user will have to spend on air conditioning, false floors, a motor-generator set. etc.)

IX. Magnetic Tape

The supplier should guarantee a continuous supply of usable magnetic tape. Possibly the user should be protected from unreasonable increases in the cost of tape.

X. Changes in Specifications.

The supplier should agree not to change the specifications of any part of the system without the user's approval, between the time the order is placed and the equipment is delivered.

XI. Guarantee of Operation

One method of guaranteeing operation is to have the supplier guarantee a minimum amount of usable time each week. Alternatively, it may be agreed that the user will not be charged for down time above a certain specified level or percentage. (See also IV).

XII. Acceptance Tests

There should be an agreement as to the acceptance procedure to be completed before rental begins or machine is purchased. In regard to acceptance, the contract should specify:

A. The type of acceptance tests to be run (see note 2)

B. The duration of acceptance tests

C. The allowable down time and repair time during acceptance tests.

XIII. Program Testing

The supplier should agree to provide a minimum amount of time on a system equivalent to the user's. This time would be available before the user's system is delivered and would be used for testing programs.

XIV. Special Equipment

For any unit of the system which is being constructed especially for the user, the contract should include complete, detailed technical specifications.

XV. Rental Period

The minimum rental period should be specified.

XVI. Renewing Rental Contracts

Provisions and options for renewing the rental agreement should be specified.

XVII. User's Rights

In the case of rental contracts, the condition under which the user can modify and/or service the equipment (if any) should be specified.

Note 1. Certain auxiliary units (e.g. card-to-tape converters) may be required by the user earlier than the entire system. If so, such delivery dates should be specified. Also, the problems of re-locating such auxiliary equipment at the time of the final installation should be considered.

Note 2. It is practically impossible to test *all* of the features of a computer system before acceptance. Usually the manufacturer will have a "diagnostic" test for preventive maintenance which tests most features and part of the acceptance procedure might be to have this test run with a minimum down time for a given period (e.g. not over 1/2 hour of down and repair time in 20 hours). The running of one of the user's regular programs with test data for a long period (40–80 hours) also serves to checkout the system. A complex program that uses all parts of the system (tapes, drums, printers, etc.) should be chosen.

For new models, more complex acceptance tests may be programmed. The manufacturer should program the test, if possible, but according to the user's standards.

Auxiliary units (tape-card, etc.) should be given separate acceptance tests.

Training

December 10–12, 1956 **January 7–9, 1957** **New York City**	" 'Integrated' Data Processing," seminar sponsored by AMA. For information write: American Management Association, Attention, Franc M. Ricciardi, 1515 Broadway, New York 36, N. Y.
Continuous, 1956–57 **New York City**	Seminars in operations research presented by Operations Research Institute, Inc., 41 Fifth Ave., New York 3, N. Y.
February 4–8, 1957 **Cleveland, Ohio**	Special Seminar Program, Western Reserve University, School of Library Science: Documentation Survey, Machine Aids to Librarianship, Special Libraries. For information, write to Jesse H. Shera, Dean, School of Library Science, Western Reserve University, Cleveland 6, Ohio.
January 30–February 1, 1957 **Cleveland, Ohio**	Operations Research in the Planning of Computer and Data Processing Systems, Case Institute of Technology. For information write: W. W. Abendroth, Operations Research Group, Engineering Administration Dept., Case Institute of Technology, 10900 Euclid Avenue, Cleveland 6, Ohio.
January 21–31, 1957 **Los Angeles, California**	Engineering and Management Course, UCLA College of Engineering, and Graduate School of Business Administration. For information write to: Edward P. Coleman, Coordinator, Engineering and Management Course, College of Engineering, University of California, Los Angeles 24, California.

Meetings

November 26–30, 1956 **New York City**	Third International Automation Exposition and Computer Clinic. Trade Show Building. For information, write International Automation Exposition, 845 Ridge Ave., Pittsburgh 12, Pa.
November 29–30, 1956 **New York City**	Operations Research Conference, Hotel Commodore, sponsored by Society for Advancement of Management, and The Institute of Management Sciences. For information write: Society for Advancement of Management, 74 Fifth Avenue, New York 11, New York.
November 26–27, 1956 **New York City**	"The Challenge of Automatic Data Processing to Senior Officers," sponsored by Third International Automation Exposition and Fordham University, at New Yorker Hotel.
November 28–29, 1956 **New York City**	"Human Engineering–Automation and Man," sponsored by Third International Automation Exposition and Manhattan College, at New Yorker Hotel.
December 10–12, 1956 **New York City**	Eastern Joint Computer Conference, Hotel New Yorker. Theme: "New Developments in Computers and Components." For information write: Albert J. Forman, Tele–Tech, 480 Lexington Ave., New York 17, N. Y.
February 26–28, 1957 **Los Angeles, Calif.**	Western Joint Computer Conference, Statler Hotel. Theme: "Techniques for Reliability." For information write: S. D. Wanlass, Systems Research Corp., 13729 Victory Blvd., Van Nuys, Calif.
May 12–16, 1957 **Los Angeles, Calif.**	International Conference and Exposition sponsored by NOMA. For information write 132 West Chelten Ave., Philadelphia 44, Pa.

References

The addresses of publishers and periodicals mentioned in this issue of Data Processing Digest are listed below for your convenience in obtaining further information about the articles or books listed.

American Management Association
1515 Broadway, Times Square
New York 36, New York

Banking
12 East 36th Street
New York 16, New York

Best's Life News
75 Fulton Street
New York 38, New York

Business Week
330 West 42nd Street
New York 36, New York

Control Engineering
330 West 42nd Street
New York 36, New York

The Controller
Two Park Avenue
New York 16, New York

Credit & Financial Management
299 Fourth Avenue
New York 3, New York

Computers and Automation
513 Avenue of the Americas
New York 11, New York

Engineering News–Record
330 West 42nd Street
New York 36, New York

Journal of Machine Accounting
53 West Jackson Boulevard
Chicago 4, Illinois

Nation's Business
U. S. Chamber of Commerce
U. S. Chamber Building
Washington, D. C.

Office Executive
132 West Chelten Avenue
Philadelphia 44, Pennsylvania

Operations Research: The Journal of ORSA
Mount Royal and Guilford Avenues
Baltimore 2, Maryland

Purchasing
205 East 42nd Street
New York 17, New York

Railway Age
30 Church Street
New York 7, New York

United States Investor
286 Congress Street
Boston 10, Massachusetts

See DPD September 1956 for list of more than seventy periodicals regularly reviewed for significant information in the data processing and related fields.

DATA PROCESSING DIGEST is published each month by Canning, Sisson and Associates, 1140 South Robertson Boulevard, Los Angeles 35, California. Subscription rate: $24.00 per year. Foreign postage (exclusive of Canada and Mexico): $1.00 additional. Single copies: $3.00 when available. Editor: Margaret Milligan.